

## REMARKS

### STATUS OF THE APPLICATION

Claims 1–42 are pending in the present application. In an Office Action dated March 17, 2003, the Examiner rejected claims 1–6, 8–12 and 14–19 under 35 U.S.C. § 103(a). The Examiner objected to claims 7, 13 and 20 as allowable but dependant on a rejected base claim. New claims 21–42 are presented for the first time in this response.

### PREVIOUSLY FILED CLAIMS

Applicant has amended each of claims 7, 13 and 20 to expressly incorporate the limitations from the relevant base claims that distinguish these claims from the prior art. Because each of these limitations was already in the claim implicitly by dependence, no new limitations have been added to these claims and the claim scope is not narrowed. Because these amendments do not narrow the claims, Applicant respectfully submits that no amendments have been made that would give rise to any prosecution history estoppel or otherwise restrict the scope of the claims under the doctrine of equivalents. Applicant has further added new claims 21–42, which are supported by the specification.

### NEW CLAIMS

Applicant has added new independent claims 21 and 32, which include the limitation of a mounting ridge for attaching a component to the heat sink. Support for the limitation of a mounting ridge can be found in the Specification at p. 6, ll. 5–7. None of the prior art of record discloses such a feature.

Applicant has also added new independent claims 27 and 38, which include limitations directed to the configuration of the internal fins. Support for these limitations can be found in the Specification at p. 3, ll. 13–14; p. 6, l. 16 – p. 7, l. 7; and in Figs. 2 and 4. The internal fins disclosed in U.S. Patent No. 4,368,777 to Grasso (“Grasso”) do not vary in length from an interior surface. Rather, the fins in Grasso all extend to the same length, which uniformly decreases along the longitudinal axis to prevent fin damage through overheating. Additionally, the Grasso fins extend radially, not in parallel. Likewise, neither Gandre, Butterbaugh or Campbell disclose sets of internal fins with the internal fins in each set extending in parallel to varying lengths.

Given the above, Applicant contends that each of claims 21, 27, 32, and 38, as well as each of claims depending therefrom, are patentable and in condition for allowance. Applicant thus requests that the Examiner indicate the allowance of these claims in the next paper from the Patent Office.

\* \* \* \* \*

Applicant requests any extension of time that may be deemed necessary to further the prosecution of this application.

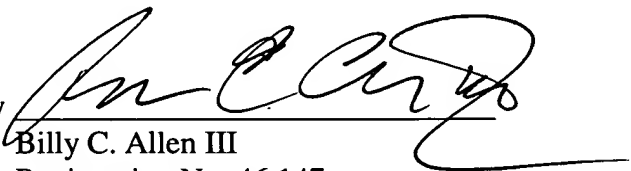
Based on the number of new claims added, Applicant calculates a fee due in the amount of \$426. The undersigned representative authorizes the Commissioner to charge this fee and any additional fees that may be required to Deposit Account No. 01-2508, referencing Order No. **10793.0013.NPUS00**. Likewise, please credit any overpayment to the same account and order.

To facilitate the resolution of any issues or questions presented by this paper, Applicant authorizes the Examiner to directly contact the undersigned by telephone.

To promote the prosecution of this application, Applicant authorizes the Examiner to contact the undersigned attorney by electronic mail. Please address all e-mail to: [allenb@howrey.com](mailto:allenb@howrey.com).

Respectfully submitted,

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**APPENDIX: REDLINE COPY OF CLAIMS  
SHOWING CHANGES RELATIVE TO PREVIOUS VERSION**

1. (cancelled)

2. (cancelled)

3. (cancelled)

4. (cancelled)

5. (cancelled)

6. (cancelled)

7. (amended) ~~The A~~ heat sink ~~of Claim 1~~ for cooling a component, the heat sink comprising:

a tubular body having an interior surface and an exterior surface, at least a portion of the exterior surface being substantially flat and contacting the component to remove heat from the component; and

a plurality of internal fins extending from the interior surface of the tubular body; wherein the heat sink has a mounting ridge for mounting a clip to hold the component against the substantially flat portion of the tubular body.

8. (cancelled)

9. (cancelled)

10. (cancelled)

11. (cancelled)

12. (cancelled)

13. (amended) ~~The~~ A heat sink assembly ~~of Claim 8,~~ for cooling a component on a circuit board, the heat sink assembly comprising:

a tubular body having an interior surface, an exterior surface, and two open ends,  
at least a portion of the exterior surface being substantially flat and contacting  
the component to remove heat from the component;

a plurality of internal fins extending from the interior surface of the tubular body;  
and

a fan attached to one of the two open ends of the tubular body to force ambient air  
through the tubular body;

wherein the tubular body has a mounting ridge for mounting a clip to hold the  
component against the substantially flat portion of the tubular body.

14. (cancelled)

15. (cancelled)

16. (cancelled)

17. (cancelled)

18. (cancelled)

19. (cancelled)

20. (amended) ~~The A cooktop of Claim 14, comprising:~~

a cooking plate;

a plurality of heating units mounted below the cooking plate;

a controller housing unit mounted below the cooking plate;

a circuit board for controlling the heating units, the circuit board having a plurality of components, the circuit board mounted inside the controller housing unit;

a heat sink assembly for cooling the plurality of components of the circuit board, the heat sink assembly attached to the circuit board, the heat sink mounted inside the controller housing unit, the heat sink assembly having

a tubular body having an interior surface, an exterior surface and two open ends;

a plurality of internal fins extending from the interior surface of the tubular body; and

a fan attached to one of the two open ends of the tubular body to force ambient air through the tubular body;

wherein the exterior surface of the tubular body contacts the plurality of components to remove heat from the components; and

wherein the tubular body has a mounting ridge for mounting a plurality of clips to hold the plurality of components against the exterior surface of the tubular body.

21. (new) A heat sink for cooling a component, the heat sink comprising:

a tubular body having an interior surface and an exterior surface, a portion of the exterior surface being substantially flat;

a plurality of internal fins extending from the interior surface of the tubular body;  
and

a mounting ridge for attaching the component such that the component is in contact with the substantially flat portion of the exterior surface.

22. (new) The heat sink of claim 21, wherein the internal fins are arranged in a plurality of sets, with the internal fins of each set extending in parallel to varying lengths.

23. (new) The heat sink of claim 22, wherein the internal fins are generally symmetric around a center line of the tubular body.

24. (new) The heat sink of claim 23, wherein the fins in a center of a set are longer than the fins at an edge of a set.

25. (new) The heat sink of claim 21 further comprising a plurality of exterior fins extending from the exterior surface of the tubular body

26. (new) The heat sink of claim 25 further comprising a fan positioned adjacent to an open end of the tubular body.

27. (new) A heat sink for cooling a component, the heat sink comprising:

a tubular body having an interior surface and an exterior surface, a portion of the exterior surface being substantially flat for contacting the component; and  
a plurality of internal fins, arranged in a plurality of sets, extending in parallel to varying lengths from the interior surface of the tubular body.

28. (new) The heat sink of claim 27, wherein the internal fins are generally symmetric around a center line of the tubular body.

29. (new) The heat sink of claim 28, wherein the fins in a center of a set are longer than the fins at an edge of a set.

30. (new) The heat sink of claim 27 further comprising a plurality of exterior fins extending from the exterior surface of the tubular body.

31. (new) The heat sink of claim 30 further comprising a fan positioned adjacent to an open end of the tubular body.

32. (new) A cooktop comprising:

- a cooking plate;
- a plurality of heating units mounted below the cooking plate;
- a controller housing unit mounted below the cooking plate;
- a circuit board, mounted inside the controller housing unit, for controlling the heating units, the circuit board having a plurality of components; and
- a heat sink attached to the circuit board for cooling the plurality of components, the heat sink comprising:
  - a tubular body having an interior surface and an exterior surface, a portion of the exterior surface being substantially flat;
  - a plurality of internal fins extending from the interior surface of the tubular body; and
  - a mounting ridge for attaching the components such that the components are in contact with the substantially flat portion of the exterior surface.

33. (new) The cooktop of claim 32, wherein the internal fins are positioned in a plurality of sets, with the internal fins in each set extending in parallel to varying lengths.

34. (new) The cooktop of claim 33, wherein the internal fins are generally symmetric around a center line of the tubular body.

35. (new) The cooktop of claim 34, wherein the fins in a center of a set are longer than the fins at an edge of a set.

36. (new) The cooktop of claim 32 further comprising a plurality of exterior fins extending from the exterior surface of the tubular body.

37. (new) The cooktop of claim 36 further comprising a fan positioned adjacent to an open end of the tubular body.

38. (new) A cooktop comprising:

- a cooking plate;
- a plurality of heating units mounted below the cooking plate;
- a controller housing unit mounted below the cooking plate;
- a circuit board, mounted inside the controller housing unit, for controlling the heating units, the circuit board having a plurality of components; and
- a heat sink attached to the circuit board for cooling the plurality of components, the heat sink comprising:
  - a tubular body having an interior surface and an exterior surface, a portion of the exterior surface being substantially flat for contacting the component; and
  - a plurality of internal fins, arranged in a plurality of sets, extending in parallel to varying lengths from the interior surface of the tubular body.

39. (new) The cooktop of claim 38, wherein the internal fins are generally symmetric around a center line of the tubular body.

40. (new) The cooktop of claim 39, wherein the fins in a center of a set are longer than the fins at an edge of a set.

41. (new) The cooktop of claim 38 further comprising a plurality of exterior fins extending from the exterior surface of the tubular body.

42. (new) The cooktop of claim 41 further comprising a fan positioned adjacent to an open end of the tubular body.